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AN EXPLORATORY STUDY ON THE IMPACT OF CLUSTERS ON THE PLASTIC INDUSTRY IN TAMIL NADU

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ABSTRACT

Economic growth needs to be both faster and balanced in order to attain a more equitable and sustainable development. This development of the economy should also encompass regions and sectors as well as persons. This examines the impact of soft intervention measures and the hard intervention measures of the sample plastic units in Chennai. The collective bargaining that the member of the cluster can achieve is not possible in the case of the non-member units and this is seen in the lesser revenue, which is due to lesser competitive price in the market.

KEYWORDS: Cluster, Government, Intervention, Plastic

INTRODUCTION

Economic growth needs to be both faster and balanced in order to attain a more equitable and sustainable development. This development of the economy should also encompass regions and sectors as well as persons. Overall development of the economy calls for more balanced growth involving wide variety of stakeholders in the society and economy. The Micro, Small and Medium enterprises are facing severe economic crisis due to the deregulated atmosphere and many of them were shut down during the post-liberalisation period. This has affected the industrial climate and also the employment scenario, since they used to employ unskilled and semi skilled workers largely. This made the Government to embark upon the 'cluster approach' with active Government support. In this background, the objectives of the paper are to: examine the impact of soft intervention measures and the hard intervention measures of the sample plastic units in Chennai.

CLUSTER AND THE SAMPLE UNITS

'Cluster' denotes concentration of enterprises engaged in the manufacture of same or similar products in a specific area. They are all linked by commonalities and complementarities having proximity to each other. Thus, clusters' success depends on Co-location, Co-existence and Co-operation. Currently, there are 168 clusters in Tamil Nadu, of which the State intervention has already started in 46 clusters including the plastic industry, which is functioning in Chennai region. Apart from the 30 units which are functioning as members of the cluster, another 30 units which are functioning outside the cluster, but are located in Chennai region are also selected for this study as sample units. Among them, a total of 41 units, 21 members and 20 non-members have provided all necessary information for this study.

REVIEW OF LITERATURE

Marshal (1920) examined the idea of clustering in industrial organizations. He explained the reason for particular specialized industries to concentrate in selected areas through industrial districts which he defined as concentration of specialized industries of similar kind in a particular locality. Pouder and John (1996) described geographic clustering of firms in the same industry through hot spot which they defined as regional clusters of firms that compete in the same industry. However, Porter (1998) was the one who gave the cluster concept relevance. Porter defined clusters as geographic concentration of interconnected companies and institutions in a particular field which includes all stakeholders. Clusters are defined as sectoral and geographical concentration of enterprises, especially small and medium, which share a future, both in terms of opportunities and threats (UNIDO, 2006; Das et al., 2007).

PROFILE OF THE SAMPLE RESPONDENTS

The profile of the sample units based on their status is examined here.

Table 1 show obviously, the dominance of males is quite prominent in ownership, while most of them are graduates and on the basis of their social groupings, the share of mainstream communities is higher, while the marginalised segments lag behind. Overall, the first generation entrepreneurs dominate the scene; the proportion of second generation is higher among the members compared to the non-members. Moreover, non-members have invested more which might be due to the expectation of reaping the advantage of economies of scale and also to face the competition from the members of cluster, even though they are Micro units. This further underlines the point that the non-members are greater risk takers compared to the members.

Table 1: Status-Wise Profile of the Sample Units

Category	Member	Non-Member	Total
Gender			
Male	18	18	**36**
Female	3	2	**5**
Education			
Upto Hr. Sec.	2	2	**4**
UG and others	14	12	**26**
PG and above	5	6	**11**
Social Status			
Mainstream	16	18	**34**
Marginalised	5	2	**7**
Entrepreneurship			
1st Gen	12	16	**28**
2nd Gen	9	4	**13**
Unit Type			
Micro	7	2	**9**
Small	14	18	**32**

Source: Primary data

IMPACT OF THE CLUSTER APPROACH: SOFT INTERVENTION MEASURES

The soft intervention is an initiative that is aimed to improve the core competencies of the cluster groups in general and *per se* there is no creation of assets. This sort of intervention is a prerequisite for establishing physical and tangible benefits within the group. They are undertaken with the assistance of the Central Government for a period of three years. The mean values and the variances in the opinions of the member and non-member units are tested by comparing through the t-test for each measure separately and with the application of Test for Equality of Variances and Table 2 present the required data.

Table 2 shows t values are statistically significant in all but three cases, viz., 'creating data bank on market information has helped in improving unit's functioning', 'arrangements of exposure visit / trade exhibitions' and 'detailed diagnostic study for identification of the critical gap', which are statistically insignificant. In all other cases, the mean value difference is statistically significant, though sign of the t value differs. The negative sign indicates that the impact from that given measure is better among the member units *vis-a-vis* the non-member units, and *vice versa*. Hence, the testing of the Equality of Means of the soft intervention measures between the member and non-member units suggests that the sample units which are members of the cluster have benefitted from the intervention measures in a significant manner, while it is also seen that the non-member units too have expressed not only considerable improvement, but also in a significant way from such measures, which is more important from the success of such clusters. As noted already, this perception of the non-member units may be mainly due their restricted anticipation from the said soft intervention measures, as they are not members of the clusters.

Table 2: Testing the Impact of Soft Intervention Measures

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Training for achievement	37.63 [a]	0.00	-2.41 [b]	39	0.02	-0.30	0.12	-0.55	-0.05
Awareness programme	19.74 [a]	0.00	-1.96 [b]	39	0.06	-0.30	0.15	-0.61	0.01
Programmes for planning	64.94 [a]	0.00	-3.01 [a]	39	0.01	-0.45	0.15	-0.75	-0.15
Conducting business	24.57 [a]	0.00	-6.64 [a]	39	0.00	-0.85	0.13	-1.11	-0.59
Linkages	21.85 [a]	0.00	-4.09 [a]	39	0.00	-1.12	0.27	-1.68	-0.57
Programme for ISO	1.27	0.27	-2.39 [b]	39	0.02	-0.55	0.23	-1.01	-0.08
Creating data bank	1.82	0.19	1.11	39	0.27	0.17	0.16	-0.14	0.49
Networking within the cluster	0.22	0.64	3.46 [a]	39	0.00	1.00	0.29	0.42	1.59
Creating common branding	26.05 [a]	0.00	5.64 [a]	39	0.00	1.40	0.25	0.90	1.91
Preparation of common catalogue	11.64 [a]	0.00	4.67 [a]	39	0.00	1.05	0.23	0.60	1.51
Trust and confidence building	4.01 [b]	0.05	2.73 [a]	39	0.01	0.68	0.25	0.18	1.18
Capacity building	0.42	0.52	5.86 [a]	39	0.00	1.35	0.23	0.88	1.81
Development of common website	78.76 [a]	0.00	4.13 [a]	39	0.00	0.50	0.12	0.26	0.75
Development of Newsletters	25.20 [a]	0.00	2.21 [b]	39	0.03	0.30	0.14	0.03	0.58
Arrangements of exposure visit	4.04 [b]	0.05	1.98	39	0.06	0.35	0.18	-0.01	0.71
Training programme	97.88 [a]	0.00	-4.53 [a]	39	0.00	-0.90	0.20	-1.30	-0.50
Detailed diagnostic study	7.88 [a]	0.01	-1.23	39	0.23	-0.26	0.21	-0.68	0.16
Environmental and statuary licence	4.35 [a]	0.04	2.04 [b]	39	0.05	0.36	0.18	0.00	0.72
Cluster mapping	0.06	0.81	2.59 [a]	39	0.01	0.65	0.25	0.14	1.15
Value chain and its analysis	4.83 [a]	0.03	6.60 [a]	39	0.00	1.42	0.21	0.98	1.85

Note: [a] and [b] indicate 1 per cent and 5 per cent levels of significance

HARD INTERVENTION MEASURES

Unlike soft intervention measures which do not involve creation of tangible assets, hard interventions do create such assets within the cluster group for the benefit of the plastic units. The opinions and the mean scores have been tested with the application of t-test for Equality of Means and the Test for Equality of Variances and Table 3 presents the required data.

Table 3 shows mean difference in the case of 'setting common production centre has helped in improving unit's functioning' is highly significant and the negative sign suggests that the improvement is better among the member units than in the case of the non-member units. This is also the case with other measures like 'Testing labs has helped in improving unit's functioning', 'R & D centre has helped in improving unit's functioning', 'Internal road connectivity', and 'cluster has had a positive demonstration effect'. In all these measures the mean difference between the member and non-member units is statistically significant and the negative sign of the t-value indicating better improvement from that measure over that of the non-member units. This indicates that the beneficial impact from the hard intervention measures is quite restricted compared to the soft intervention measures, as perceived by the sample entrepreneurs. As far as the non-member units are concerned, it is quite difficult for them to anticipate that they can attain any substantial benefit from the hard intervention measures since such measures are provided within the cluster and cannot be expected to percolate to the external units. Thus, as the mean scores indicated, for most of the measures, many non-member units have opined that there is no change in their condition.

Table 3: Testing the Impact of Hard Intervention Measures

	Levene's Test for Equality of Variances		t-test for Equality of Means					95 % Confidence Interval of the Difference	
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Setting common production centre	1.50	0.23	-10.07 [a]	39	0.00	-2.31	0.23	-2.78	-1.85
Design centre	1.70	0.20	-1.20	39	0.24	-0.36	0.30	-0.97	0.25
Testing labs has helped	0.11	0.74	-8.84 [a]	39	0.00	-2.08	0.23	-2.55	-1.60
R & D centre has helped	3.34	0.08	-6.63 [a]	39	0.00	-1.50	0.23	-1.96	-1.05
Common raw material bank	2.07	0.16	0.30	39	0.77	0.08	0.26	-0.45	0.61
Common sales display centre	3.60	0.07	1.60	39	0.12	0.43	0.27	-0.11	0.96
Creation of common infrastructure	5.83 [b]	0.02	0.07	39	0.95	0.02	0.32	-0.64	0.68
Internal road connectivity	1.40	0.25	-3.46 [a]	39	0.00	-1.04	0.30	-1.65	-0.43
External road connectivity	2.89	0.10	-3.79 [a]	39	0.00	-1.14	0.30	-1.75	-0.53
Drainage facility within the cluster	2.99	0.09	0.84	39	0.40	0.18	0.21	-0.25	0.60
Uninterrupted water supply	18.37 [a]	0.00	-0.36	39	0.72	-0.09	0.25	-0.59	0.41
Cheaper water supply	23.47 [a]	0.00	-1.41	39	0.17	-0.33	0.23	-0.80	0.14
Effluent treatment, Mgt. Of wastewater	10.88 [a]	0.00	-1.03	39	0.31	-0.31	0.30	-0.91	0.30

Table 3 Contd.,

Uninterrupted power supply	0.07	0.80	-2.75 [a]	39	0.01	-0.56	0.21	-0.98	-0.15
Development of industrials estates/ Plots	40.48 [a]	0.00	-3.78 [a]	39	0.00	-0.71	0.19	-1.10	-0.33
Efficient conservation of energy	51.51 [a]	0.00	-8.37 [a]	39	0.00	-1.62	0.19	-2.01	-1.23
cluster has demonstration effect	3.75	0.06	-4.61 [a]	39	0.00	-1.34	0.29	-1.93	-0.75
Greater trust and cohesiveness	15.13 [a]	0.00	-1.77	39	0.09	-0.49	0.28	-1.06	0.07
Common canteen	26.49 [a]	0.00	-0.21	39	0.84	-0.05	0.27	-0.59	0.48
Re –location possibilities	2.92	0.10	0.79	39	0.43	0.16	0.20	-0.25	0.57

IMPACT OF CLUSTER ON ECONOMIC VARIABLES OF THE SAMPLE UNITS

The production processes culminate in or better reflected in the economic variables of the units. Hence, it is paramount to examine the impact of the cluster in terms of the economic variables of these units. This is done in this section and Table 4 presents the descriptive statistics for the member and non-member units.

Table 4 shows fixed capital and working capital of the non-member units are less than that of the member units, which suggests the reduced or restricted investment capability, since they are not part of the cluster arrangement and certainly not in a position to claim any favourable intervention. This is also resulted in higher cost structure of the non-member units. Hence, the average total cost is also higher than that of the member units. The average annual output made by the non-member units is markedly less than that of the member units, both in physical terms and financial terms. This is also reflected in their revenue pattern. Thus, revenue and profit are less in the case of the non-member units. The collective bargaining that the member of the cluster can achieve is not possible in the case of the non-member units and this is seen in the lesser revenue, which is due to the less than competitive price that they can attain in the market. So, the non-member units are not in a position to cut down their cost of operation and thus incur higher cost per unit and their restricted level of investment also eats into their scale of operation and hence, they have to lose out in their revenue structure as well.

Table 4 Impact of Cluster on the Economic Variables

Variables	Member				Non-Member			
	Min	Max	Mean	SD	Min	Max	Mean	SD
Fixed capital (Rs. lakhs)	10.0	450.0	141.25	40.42	10.0	150.0	117.86	38.13
Working capital (Rs. lakhs)	10.0	500.0	108.18	105.02	7.5	300.0	91.95	97.90
Labour AC (Rs.)	4.0	9.0	6.06	0.81	6.0	14.0	8.05	1.64
Raw material AC (Rs.)	20.0	29.0	27.05	1.94	25.0	36.0	34.75	2.71
Total Average Cost (Rs.)	76.0	92.0	87.02	1.19	90.0	95.0	95.76	2.09
Total output (Tonnes)	144.0	1020.0	463.14	247.11	85.0	360.0	267.55	115.36
Total output (Rs. lakhs)	170.0	1437.5	655.31	358.26	125.0	1050.0	486.00	242.49
Average Revenue (Rs. lakhs)	22.00	185.00	85.38	44.91	15.00	42.00	55.42	10.28
Average Profit (Rs. lakhs)	10.0	80.0	33.45	20.28	12.0	35.00	21.85	83.52

Source: Computed

CONCLUSIONS

The analysis indicates that non-members have invested more which might be due to the expectation of reaping the advantage of economies of scale and also to face the competition from the members of cluster, even though they are Micro

units and hence, the non-members are greater risk takers. The issues faced by the MSMEs with regard to accessing institutional credit has not improved much even under the cluster arrangement and the non-member units too could not boast off much. The member units perceive that lack of coordination within the cluster, lack of awareness among the owners about the existing government policies, institutional finance, plastic industry *per se*, and the MSMEs in general and inadequate guidance for the units are felt severely compared to the non-member units. The collective bargaining that the member of the cluster can achieve is not possible in the case of the non-member units and this is seen in the lesser revenue, which is due to lesser competitive price in the market. The improvement made by the sample units in the ex-post period, wherein they are able to reduce their cost, increase output and also to earn more comparatively is clearly understood.

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